

Sample Questions

Don't use calculators.

1. (a) What is $|-3.57|$?
(b) Can $|x|$ ever equal $-x$? (Yes or No)
2. (a) What is $\lfloor -3.8 \rfloor$?
(b) What is $\lceil -3.8 \rceil$?
(c) What is $\lfloor 3.8 \rfloor$?
(d) What is $\lceil 3.8 \rceil$?
(e) Can $\lfloor x \rfloor$ ever equal $\lceil x \rceil$? (Yes or No)
(f) Can you find a general formula for $\lfloor x \rfloor$ in terms of $\lceil x \rceil$?
3. (a) Evaluate: $9!$
(b) Using your answer to (a), write down the value of: $10!$
(c) Evaluate: $2000!/1999!$ (Don't work out $2000!$ or $1999!$)
4. (a) Does $a^x \cdot a^y$ equal a^{xy} or a^{x+y} ?
(b) Does $(2^3)^4$ equal $2^{(3^4)}$? If not, give a reason.
(c) Consider the function $y = 2^x$.
 - (i) When $x = 0$, what is y ?
 - (ii) Can y ever equal 0?
 - (iii) Can y be negative?
5. (a) Evaluate $\log_2 128$.
(b) Evaluate $\log_2 1/4$.
(c) Evaluate $\log_2 1$.
(d) Evaluate $\log_2 2^{3596}$.
(e) If $y = 3^x$, express x in terms of y .
(f) If $y = \log_5 x$, express x in terms of y .
6. (a) What is the degree of the polynomial $f(x) = x^3 - 5x + 1$?
(b) Evaluate $f(1)$.
(c) Evaluate $f(2)$.
(d) Is $f(x)$ always negative? Give a reason for your answer.
(e) What is the degree of the polynomial $g(x) = -x^3 + x^2 + 7x + 3$?
(f) Write down the polynomial $f(x) + g(x)$.
(g) What is the degree of the polynomial $f(x) + g(x)$?
(h) Is it always true that $\deg[f(x) + g(x)] = \deg[f(x)] + \deg[g(x)]$?
(i) What is the degree of the polynomial $h(x) = 4x - 1$?
(j) Find the polynomial $f(x)h(x)$.
(k) What is the degree of the polynomial $f(x)h(x)$?
(l) Is it always true that $\deg[f(x)h(x)] = \deg[f(x)] + \deg[h(x)]$?
(m) Can you give a formula for $\deg[f(x)h(x)]$ in terms of $\deg[f(x)]$ and $\deg[h(x)]$?
7. (a) Evaluate $\sum_{i=1}^5 2^i$.
(b) Rewrite $\sum_{i=1}^5 2^i$ in Sigma notation as a sum whose summation index starts at 0 and ends at 4.
(c) Express in Sigma notation: $1 + 2 + 3 + 4$.
(d) Evaluate $\prod_{i=0}^3 (2i + 1)$.
(e) Express in Pi notation: $2 \cdot 4 \cdot 6 \cdot 8$.